

SYLLABUS

Economic Geology 7.5 credits Q0020B

Ekonomisk geologi

Course syllabus admitted: Autumn 2017 Sp 1 - Present

**DECISION DATE
2017-02-08**

Economic Geology 7.5 credits Q0020B

Ekonomisk geologi

First cycle, Q0020B

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Berg- och mineralteknik	Mining and Mineral Technology

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language

Selection

The selection is based on final school grades or Swedish Scholastic Aptitude Test.

Examiner

Rob Hellingwerf

Course Aim

After the course the student should be able to:

- Participate in projects where geochemical or geophysical exploration constitutes the main activity
- Carry out independent sampling campaigns in which solid rock, sediment or water samples comprise the basis for identification of anomalies
- Participate in jobs where calculation of exploration costs is necessary, and
- In cooperation with geologists and engineers participate in planning and evaluating exploration orientated drilling programs.

Contents

The course provides knowledge on geological exploration criteria, phases of exploration and various exploration methods. Additionally, the student will acquire insight into exploration models, difference between indicator and pathfinder elements, interpretation of various anomalies, exploration economics, planning of drilling programs and estimation of ore reserves. The presentation methodology is of general nature and the student is provided with know-how that can be applied to mineral exploration in a straightforward manner. The course contains the following subjects:

- Geological criteria for exploration: stratigraphical-, lithological-, structural-, magmatogenic-, metamorfogenic-, geomorphological-, paleogeographical-, paleoclimatic- and historical criteria
- Phases of exploration: general-, preliminary- and detailed phases. Discussion of Conceptual Model within exploration
- Geochemical exploration methods: anomalies in litho-geochemistry, soil chemistry (a.o. "Ridge and Spur" and "Base of Slope" sampling), stream sediment, heavy mineral concentrate, hydrogeochemistry, biogeochemistry and atmo-geochemistry
- Geophysical exploration methods: anomalies of gravimetry, magnetism, resistivity, IP, SP, mise-a-la-mase, electro-magnetics, radioactivity and seismics
- Exploration economy: "reserves" versus "resources", calculation of number of drillholes per mineralised block, and calculation of ore value
- Underground visit: mining methods, ore economics, beneficiation processes, measures of security underground

Realization

Each course occasion's language and form is stated and appear on the course page on Luleå University of Technology's website.

The course consists of lectures, team-based project work, field visits and an excursion to a mine in operation. The mandatory mine excursion takes the students underground in order to illustrate mining methods and beneficiation techniques.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.

Examinationen comprises a written test with 5,0 credits, team-based project work with 1,5 credits, and field visits with 1,0 credits.

Literature. Valid from Autumn 2012 Sp 1

- Hellingwerf, R. (2006) Economic Geology, kompendium. Bergsskolan.
- Kuzvart, Milos, Böhmer, Miloslav., (1986) Prospecting and exploration of mineral deposits. 2 uppl. Amsterdam ;

Oxford : Elsevier. (508 s). ISBN 0-444-99515-3

- Peters, William C.. (1978) Exploration and mining geology. New York : Wiley. (696 s). ISBN 0-471-68261-6

- Rose, Arthur W. Hawkes, Herbert E. Webb, John S.. (1979) Geochemistry in mineral exploration. 2 uppl. London : Academic P.. (657 s). ISBN 0-12-596252-5

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Items/credits

Number	Type	Credits	Grade
0002	Written exam	5	G U 3 4 5
0003	Group work	1.5	U G#
0004	Excursions	1	U G#

Last revised

by Assistant Director of Undergraduate Studies Eva Gunneriusson, Department of Civil, Environmental and Natural Resources Engineering 2017-02-08

Syllabus established

by Lars Bernspång 2012-04-03